Relations industrielles
Industrial Relations

Micro-electronics Technology and Industrial Relations

Harish C. Jain

Volume 38, numéro 4, 1983

URI : https://id.erudit.org/iderudit/029410ar
DOI : https://doi.org/10.7202/029410ar

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Éditeur(s)

Département des relations industrielles de l'Université Laval

ISSN

0034-379X (imprimé)
1703-8138 (numérique)

Découvrir la revue

Citer cet article

Jain, H. C. (1983). Micro-electronics Technology and Industrial Relations. *Relations industrielles / Industrial Relations*, *38*(4), 869–879. https://doi.org/10.7202/029410ar

Micro-electronics Technology and Industrial Relations

Harish C. Jain

Technological change has long been an important characteristic of industrial evolution in the Western world. The two most important enabling technologies in the post war period are automation and micro-electronics or chip technology. The first one began in the 1950's and the second in the 1970's, and is now in progress. The chip technology is different from the previous technological innovations in that it can be adopted in practically all sectors of the economy and thereby affect a wide range of activities from production to distribution to consumption. It promises to bring about significant structural changes. For instance, while the conventional mass production or assembly line system, in part because of economies of scale, was suited to large scale enterprises such as Stelco, Dofasco, Firestone, Ford, and General Motors, in industries such as steel, rubber, automobile etc., the chip technology can be employed by small and medium enterprises since it is suited to produce a variety of products in small quantities.

Microelectronics (ME) technology takes at least two forms: office and factory automation. In the factory, many jobs in manufacturing which required human intelligence can now be performed with machine intelligence, first by simplifying products and second by automating the production processes. Numerous products have been simplified over the past few years. For example, an electronic watch now requires the assembly of only five components compared with some 1000 assembly operations for a mechanical watch; in the manufacture of sewing machines, one microprocessor has replaced 350 mechanical parts. The production process is automated through the application of computer assisted design and computer assisted manufacturing (CAD/CAM), robots, computer controlled machine tools and automated material handling techniques. Robots in manufacturing can be used for metal pressing, welding, machining, painting, casting and forging. Robots can be used in dull, repetitive, and hazardous jobs with excessive noise and high temperature. The CAD/CAM or automation of automobile factories in North America has made them twice as efficient as their less automated counterparts in the U.K.; the most automated auto factories in Japan using these (CAD/CAM) techniques, including extensive use of robotics, are twice as efficient as the North American auto plant[1].

* JAIN, Harish C., Professor, Personnel and Industrial Relations Area, Faculty of Business, McMaster University.

1 Arthur J. CORDELL, «Computers and Employment: Future Prospects», January 15, 1982.

Office automation is expected to replace the familiar «stand-alone» typewritter, filing cabinet, telephone, and office copier by a single office communications and information processing network. For example, electronic filing will replace the present paperbased memoranda, business manuals, directives, notices and directories with storage of this information in voice, graphic and textual forms accessible electronically by employees, and multifunction workstations will make it possible for office workers, support staff and managers to make simple telephone calls, leave digitally encoded voice messages, activate microelectronically controlled copiers, print forms or letters, and write and/or edit reports or memos. In turn, all work stations will be linked to computer data base, a duplicating and printing centre and a communication centre[2].

The emergence and widespread adoption of microelectronics (ME) technology has serious implications for industrial relations. The Task Force on Microelectronics and Employment, created by the Federal Labour Minister in March 1982 examined these implications in its November 1982 report to the Minister. As a member of the task force, I helped develop recommendations in this and other areas.

This paper outlines (1) the mandate of the Task Force (TF), (2) important assumptions made by the TF as well as (3) the rationale for making recommendations in the industrial relations area including (4) the specific recommendations made by the TF.

The Mandate: The TF was instructed to examine the methods by which microelectronic (ME) technology is being incorporated into the workplace, the extent to which this has already occurred, and the implications of this process on working persons. The focus was cast primarily, though not exclusively, on industries and organizations falling under the *Canada Labour Code,* with a view to proposing amendments that would make the Code more responsive to the needs of working people. The indirect effect may be to influence other labour codes. The TF was given six months to produce the report. In view of these limitations, we decided to look at the impact of ME technology on office automation thereby excluding factory automation.

We benefitted a great deal by public input in the six cities in which we held hearings — Toronto, Montréal, Halifax, Vancouver, Edmonton and Ottawa in that order. We had several excellent oral and written presentations from important trade unions and employers especially the ones whose members and employees respectively are likely to be and are being affected by ME technology as well as women's organizations and concerned citizens. We also received written briefs and toured the Silicon Valley in California and Ottawa and met with individual employers in micro-chip business (in Montréal such as AES, Micom & Mitel).

2 *Planning Now for an Information Society: Tomorrow is too Late,* Ottawa, Science Council of Canada, March 1982. Also see, *The Electronic Office in Canada,* Ottawa, Dept. of Communications, May 1982.

The TF commissioned research studies on the *Canada Labour Code,* employment concerns, health and safety concerns, triggering technologies, and case studies of several industries under federal jurisdiction such as banking, transportation (CP Ltd., & Air Canada) Canada Post, and communications.

Technology: The TF clearly and unequivocally endorsed the introduction of ME technology in Canada. We recommended that Canada needs to encourage and support the continued development of high technology industries and the diffusion of their products and services in the Canadian economy. This is based on the assumption that ME technology has the potential to create jobs, to increase productivity, to improve economic growth, and to enrich personal development. One of the very first and a central recommendation of the TF was to establish a federally funded Centre of Technology, Work and Human Priorities[3]. The Centre was to have representation from labour, management, government and other important sectors and its mandate involved three main functions: job creation, public information and research, and monitoring. On April 19, 1983 the recommendation to establish such a Centre to be called a National Centre for Productivity and Employment Growth was announced in the budget speech by the Federal Finance Minister, Mr. Marc Lalonde. On August 3, 1983, the then Federal Labour Minister Charles Caccia and his colleage Ed Lumley, Minister of Industry, Trade & Commerce and Regional Expansion appointed a Steering committee for the Centre to examine the issues of productivity, technology and employment growth and to make proposals concerning the objectives, mandate, role, structure and financing of the Centre.

The TF believed that there was a direct link between ME technology and jobs. To resist the adoption of the new technology would be counterproductive. Several studies commissioned by the TF and public representations made it clear to us that by resisting the introduction of ME technology, (1) Canadians stand to lose more jobs than by adopting it, (2) Canada's export dependence will be severely and adversely affected (since about 25 to 30 percent of Canada's output is sold in foreign markets), and that (3) autonomy of decision-making would be seriously affected[4].

Assumptions: One of the tasks of the proposed Productivity Centre is to have continuous consultations between labour and management. It is based on the recognition that microchip technology cannot be utilized efficiently in an environment of confrontation and agitation that arises due to a conflict between «management's prerogatives» and workers concern for «job security». Canada cannot afford the social unrest that would inevitably occur if managements and unions repeat the mistakes made by the Canada Post Office during its early phases of postal automation in the late 1960's and early 1970's.

3 *In the Chips: Opportunities, People, Partnerships,* Report of the Labour Canada Task Force on Micro-Electronics and Employment, Ottawa, Canada, 1982.

4 The T.F. was told that Canadian ownership of the high technology industry is important since it affects autonomy of decision-making which in turn affects the quality of head office jobs and research and development representing the capacity of a company to regenerate itself.

An example of this assumption by the TF is contained in the forward-looking *Committee on the Future Report* which took two years drafting proposed changes and recommendations. The report was prepared for the special convention of the Communication Workers of America which was held on March 28, 1983. In this report, the Committee recommended new approaches to grievance handling through joint problem-solving and a less confrontational approach by union to management in order to meet the challenge of the ME technology. (The Committee's Report goes on to recommend that the union become a technologically sophisticated union, with electronic mail and membership lists, computer teleconferencing and computer-aided learning.)

Labour-management cooperation is required because (a) Joint problem-solving, innovation and adaptation is necessary in view of the fast changing technology; (b) Society expects business and labour to act responsibly and holds them socially accountable; (c) There is a growing emphasis on self-actualization and self-determination as represented by greater rank-and-file direction of collective-bargaining within unions and in greater worker demands for some form of «industrial democracy» within unions as well as management; (d) There is a growing awareness that sustained rapid growth of productivity requires active cooperation among workers, unions and management since productivity growth is vital to all three parties; and (e) There is a greater acceptance now, than before, of individual and group entitlements and rights as represented by several recent developments: (i) the enactment of human rights statutes in all jurisdictions in Canada, (ii) the Charter of Rights and Freedoms as part of our newly repatriated Constitution (1982) and (iii) the Freedom of Information legislation enacted in 1982 and proclaimed in July 1983, as well as (iv) widespread protests in British Columbia against the threatened abrogation of some of these rights such as human rights by the B.C. government.

There are indications that one of the consequences of the deep recession of 1981-82 is that management and labour may have learned how to deal with their problems on a more constructive and cooperative basis than in the past which has predominantly been characterized by adversarial approaches. For example, after a number of years of heavy industrial conflict, the number of work stoppages and person-days lost in the past two years has dropped about one-third[5].

Rationale: The TF recommendations were based on at least four analytical reviews. There were:

5 W. Donald WOOD and Pradeep *KUMAN, The Current Industrial Relations Scene in Canada,* Kingston: Queen's University, July 1983. Also see Ronald ANDERSON, «Better labour-management ties may be legacy of recession», *Globe & Mail,* July 26, 1983.

(1) Public Policy Developments in Selected Western European Countries:

Our review of policy developments in Western Europe especially Scandinavian countries[6] disclosed a stronger regulatory trend in the area of technological change than is now evident in Canada. Employers are generally required to provide more detailed information and to engage in consultation with their employees prior to the introduction of a change. The mandatory creation of bipartite committees operating at the level of individual establishments to help plan for change is a common feature of the regulatory schemes we reviewed. Most schemes make provision for dispute settlement, and many include a requirement to provide compensation to displaced workers either through a lay-off plan or through the establishment of a general redundancy fund.

(2) *Relevant Industrial Relations Commissions Reports:*

A review of the findings of several previous federal commissions over the past two decades indicates that several of their recommendations are as pertinent now as they were when they were made. For example, the Woods Task Force appointed by former Prime Minister Pearson recommended in 1968 that no less than 6 months' notice be given in advance of the introduction of a technological change to allow for adjustment to change.

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6 For instance, Sweden's *Co-Determination at Work Act* (1977), the Norwegian *Work Environment Act* (1977), and the agreement in Denmark on new technology (covering the period March 1981-July 1984) signed by Denmark's Central union and employer organizations spell out union-management rights and obligations. Under the «right to information» the Swedish Act gives the local trade unions the right to information about their company's production, finances, investment plans and personnel policies and this information must be kept up-to-date by the employer. In addition, pertinent union representatives may request to see and to audit relevant company books and accounts. Under the complementary «requirements to negotiate» under Act, the employer must negotiate with the unions before important changes in production or administration are decided, and also on all matters which substantially affect working conditions or terms of employment.

The Norwegian Act treats technology, working conditions and the work environment as a synergistic issue, and requires a legal synthesis of «management prerogatives» and employees «proprietary interests» in rights over the jobs. Under the Act, a working environment committee is mandatory in all undertakings which normally employ at least 50 workers. Employers who make changes of material significance for the working environment must consult beforehand this committee and provide sufficient time and «proper involvement», joint decision-making, and training for meeting the requirements of technological changes.

The Danish agreement covers the introduction of, and any significant alterations to, production technology, including data-based technology and systems. It provides for specially created «new technology committees» and obliges employers to inform these committees in a way that is clear and easy to understand in advance of any technological plans or changes and to discuss their likely consequences for workers in the undertaking.

For references, see the March, April, August and October 1981 issues of the *European Industrial Relations Review;* the forthcoming issue (1983) of the *Bulletin of Comparative Labour,* and the report by S. MUTHUCHIDAMBARAM for the T.F. entitled «Microelectronics Technology: An Industrial Relations Perspective», (unpublished).

Similarly, the Carrothers Commission recommended «effective joint consultation» and establishment of a standing «works council» for initiating such joint consultation on a regular basis at the enterprise level. The *Labour Adjustment Benefits Act* is a direct result of the recommendations of this Commission's report. However, as we note later, it goes well beyond Carrothers.

(3) *The Relevant Activities of the Canada Labour Relations Board (CLRB):*

In 1972, provisions respecting technological change were introduced to the federal Code. In certain circumstances, they allow a union to apply to the CLRB for permission to bargain collectively with the employer for the purpose of revising an existing collective agreement in light of proposed technological changes. Initially, the Board expected a heavy workload as a result of the provisions but such was not the case. The few applications which were received were either withdrawn or dismissed on technical or procedural grounds. It was not until 1981 that the CLRB was asked to interpret and apply the technological change provisions of the Code. A careful study of the *Ottawa-Carleton Transit* decision, 1982, in which the CLRB had the first occasion to apply the technological change provisions of the Code, reveals in unmistakable terms the absolute frustration of the Board in trying to apply this law[7].

The following legislative shortcomings are implicit in this decision and were repeated time and again during the TF meetings with trade union and other groups.

Firstly, the current provisions contain several examples of ambiguous language. Phrases such as «substantially and adversely affect» and «signifi-

7 In the *Ottawa-Carleton Transit* Case, the transit authority planned to introduce a computerized scheduling and traffic control system. Information about its plans were communicated to the union shortly after the signing of a two-year collective agreement. The union was concerned about the proposals, since it foresaw a loss of jobs if the employer plans were implemented. It filed applications to the CLRB to (a) find that the employer had failed to give proper notice, and (b) give permission (to the union) to serve notice to bargain. The CLRB summarized the positions of the parties. The employer argued that (a) the proposals would not affect a «significant number» of employees, that is, ten per cent of the workers in the employer's view; (b) changes in job descriptions do not constitute technological change; (c) it had been unaware of the Code provisions until it learned about the union's complaint, and (d) the CLRB should exercise its discretion not to issue any order.

The union put forward the arguments that (a) the potential impact of the proposed changes went beyond changes in job descriptions, (b) a significant number of members would be affected substantially and adversely with respect to the terms and conditions of work, and (c) bargaining should occur before the proposed changes were put into effect.

The CLRB decided not to permit collective bargaining immediately, finding that no real discussion had yet taken place between the parties. It reserved the right to allow notice to bargain at a later time, should informal discussion between the parties over their respective concerns not prove fruitful. *(Ottawa-Carleton Regional Transit Commission and Amalgamated Transit Union, Locals 1502 and 279,* (1982), 1 Can. LRBR 172.)

cant number of employees» seriously undermine the usefulness of the provisions. These phrases leave the parties uncertain about whether or not they are in a situation which allows them to compell negotiations on technological change.

Secondly, the statutory definition of technological change may be too restrictive. For example:

(a) The definition does not cover all types of changes in the manner in which work is carried out which may be the result of an introduction of technology; and,

(b) the definition requires a trade union to prove too much before recommencing negotiations. The union must not only show that the employer plans to introduce new equipment or material, but also that there will be a change in the manner in which work is carried out, and that the particular change is directly related to the introduction of new equipment and material. Given the level of information on which the union may have to rely during the crucial period prior to the introduction of technology, the definition tends to inhibit rather than encourage the possibility of meaningful and timely negotiations.

Thirdly, Section 149(2) is unsatisfactory. This section relieves an employer of the statutory obligation to give notice or to recommence bargaining in the following circumstances:

(a) if the employer gave notice of a proposed change in time for it to be considered prior to concluding the last agreement;

(b) if the collective agreement contains provisions which allow for the settlement of matters pertaining to terms and conditions of employment, or security of employment, that might be affected by technological change; or

(c) if the collective agreement contains some provisions intended to assist employees adjust to the effects of change, and the agreement specifies that the statutory provisions do not apply.

These «opting out» provisions greatly weaken the overall thrust of the technological change legislation.

Fourthly, trade unions among others were unanimous in their view that the 90 day notice provision is inadequate to allow sufficient time for the union to gather information and formulate proposals concerning mechanisms to deal with the effects of technological change.

The final shortcoming relates to the inadequate level of information provided by management about its plans to introduce new technology.

(4) Technological Change Provisions in Collective Agreements

An indication of the present state of bargaining in the area of technological change is provided by statistics compiled by Labour Canada. These statistics (see Table 1) show the incidence of different types of technological change provisions, under Part V of the *Canada Labour Code,* covering 325,860 employees in 1,018 collective agreements. They show that

the majority of agreements in the federal jurisdiction contain neither procedural nor substantive provisions on technological change. Seventy-two per cent of these collective agreements make no provision for prior notice of a technological change. A much higher percentage of collective agreements have no substantive provisions for adjustment to change, such as training, retraining, relocation allowances, work-sharing or labour-management committees.

Thus, the results of our 10 years of experience with the current legislative approach suggest that a permissive approach confined to the bargaining arena is no longer sufficient. This analysis of collective agreements shows that technological change has not emerged as an area to be covered by collective agreements as frequently as would have been expected. This result provides at least one useful measure of the effectiveness of the current legislative scheme. The TF concluded that the legislation has not been successful in achieving that which it set out to do — to encourage the parties to bargain. Further, a stronger consideration lead us to the view that a revision of Part V, even a significant revision, would not suffice.

To begin with the provisions of Part V have no direct application for the majority of Canadian workers. Most Canadian employees are not unionized and hence are not protected by a formal bargaining structure.

Recommendations: The TF made the following recommendations based on the above-mentioned assumptions:

(1) To amend and broaden the present (as of 1972) definition of technological change in the *Canada Labour Code* to assure that discussion is activated as soon as management proposes to introduce any new equipment or material which could affect, either directly or indirectly the working conditions or job security of any employee.

(2) To create mandatory joint-technology committees in both unionized and non-unionized establishments of 50 or more employees under the jurisdiction of the *Canada Labour Code.* Such committees would deal with issues like training, re-training, redundancy, work sharing, and productivity improvements and other matters that result from the introduction of technological changes at the workplace.

(3) To assure that timely measures designed to ease the negative effects of a technological change on the employment of all workers are taken, the employer must be required to provide a minimum of 180 days notice of a proposed change (instead of the present requirement of 90 days notice) and

(4) That disputes concerning the powers and functions of joint technology committees or the adequacy of proposed adjustment plans be submitted for resolution by binding arbitration.

The most important and far-reaching industrial relations-related recommendation calls for establishment of a joint technology committee at all enterprises of 50 or more employees under federal jurisdiction. However, this recommendation merely extends existing legislation. For example, under the *Labour Adjustment Benefits Act,* if an employer plans to

terminate 50 or more employees within a 4-week period, a joint planning committee must be established. (In case of mass layoff, the employer is required to provide 16 weeks of advance notice.) In nonunion establishments, employees can choose one-half of the committee members. If the committee fails to agree on all issues within 6 weeks, the unresolved issues may be submitted for arbitration. The arbitrator may first try to mediate, but if this effort is not successful, must decide on the outstanding issues within 4 weeks. This legislation establishes a bargaining relationship, as opposed to consultation process envisioned by the Carrothers Commission. The Task Force on Micro-electronics and Employment, convinced that technological change can only be successful if workers are consulted in advance of a change, went one step further and recommended mandatory joint technology committees.

Summary and Conclusions: ME technology can affect all work activities. While this technology may be neutral in its abstractions, it is not necessarily so in its applications. While the new technology can facilitate the coming of an information society with a qualitative difference, it cannot do so on its own initiative. That choice, in my opinion, is ultimately the function of public policy. A reactive rather than a proactive approach can result in technological determinism with its attendant social costs. The federal TF, of which I was a member, recommended that Canada encourage and support the continued development of high technology industries since Canadians stand to gain more jobs by the adoption of ME technology than by resisting it.

The TF believed that the new technology cannot be utilized efficiently and effectively in an environment of social suspicion and unrest. We therefore recommended mandatory joint-technology committees in both unionized and non-unionized establishments of 50 or more employees under federal jurisdiction, a broadening of the definition of technological change, a requirement that an employer provide a minimum of 180 days notice of a proposed technological change and that disputes concerning the powers and functions of joint technology committees be submitted for resolution by binding arbitration. While several provinces at present do not have legislation in this area, federal legislation usually sets a precedent for other jurisdictions.

TABLE 1

Technological Change Provisions in Collective Agreements Under Part V of the *Canada Labour Code* (As of 19th May 1982)

	Agreements		*Employees*	
Provisions	*No.*	*%*	*No.*	*%*
	Notice and/or Consultation Prior to Introduction of Technological Change			
Less than 3 months	64	6.2	11 926	3.6
3 months to 6 months	165	16.2	181 270	55.6
6 months to 12 months	12	1.1	13 220	4.0
12 months or more	1	0.0	20	0.0
Other	35	3.4	7 975	2.4
No provision	741	72.7	111 449	34.2
Total	1 018	100.0	325 860	100.0
	Training or Retraining (Technological Change)			
Displaced employees OJT on new equipment	108	10.6	102 545	32.4
Displaced employee OJT for another job and on new equipment	58	5.6	37 275	11.4
Laid off employee retraining at employer's expense	13	1.2	11 225	3.4
Other	7	0.6	2 495	0.7
No provision	832	81.7	172 320	52.8
Total	1 018	100.00	325 860	100.0
	Relocation Allowance (Technological Change)			
Employer pays full cost	38	3.7	141 860	43.5
Employer pays percent of cost	1	0.0	25	0.0
Employer pays percent of cost by maximum specified	3	0.2	215	0.0
Other	2	0.1	535	0.1
No provision	974	95.6	183 225	56.2
Total	1 018	100.0	325 860	100.0
	Labour-Management Committee (Technological Change)			
Committee studies problems	45	4.4	45 750	14.0
Committee has specific administrative duties	4	0.3	360	0.1
Committee studies problems and has specific administrative duties	5	0.4	1 945	0.5
Other	3	0.2	1 125	0.3
No provision	961	94.4	276 680	84.9
Total	1 018	100.0	325 860	100.0

Provisions	Agreements No.	Agreements %	Employees No.	Employees %
Notice and/or Consultation Prior to Introduction of Technological Change				
Employment Security (Technological Change)				
Some form of wage or employment guarantee (other than SUB or severance pay)	115	11.2	113 980	34.9
Attrition	2	0.1	275	0.0
Distribution of work (includes short workweek, extended vacation)	1	0.0	25	0.0
Some form of wage or employment guarantee (other than SUB or severance pay), attrition, and/or distribution of work	4	0.3	7 575	2.3
Other	2	0.1	190	0.0
No provision	894	87.8	203 815	62.5
Total	1 018	10.0	325 860	100.0
Notice of Lay-off (Technological Change)				
Less than 3 months	23	2.2	17 105	5.2
3 months to 6 months	47	4.6	7 470	2.2
6 months to 12 months	3	0.2	180	0.0
Other (includes indefinite period or one not specified)	3	0.2	115	0.0
No provision	942	92.5	300 990	92.3
Total	1 018	100.0	325 860	100.0
Re-opener Clause (Technological Change-Wages & Working Conditions)				
Provision Exists	9	0.8	1 365	0.4
As provided by law	3	0.2	1 560	0.4
No provision	1 006	98.8	322 935	99.1
Total	1 018	100.0	325 860	100.0
Work Sharing Techniques (Technological Change)				
Job rotation	1	0.0	25	0.0
No provision	1 017	99.9	325 835	99.9
Total	1 018	100.0	325 860	100.0

Source: *In the Chips: Opportunities, People, Partnerships,* Report of the Labour Canada Task Force on Micro-Electronics and Employment, Ottawa, Canada, 1982.